

IND320 CA1 Ivar Eftedal

Use of AI

There has been no use of AI in this project.

Log of compulsory work

- The compulsory work gave me a nice base for creating an interactive dashboard to display some weather data. I learned some of the basics and fundamentals of streamlit. I was able to get most of the code working without too many issues. My biggest challenge was splitting the dates into months. I had trouble parsing the format into a date format. But other than that things went fairly smooth.
- In order to learn what I needed to do, I spent most of my time reading the documentation of streamlit. I also spent some time reading the documentation of pandas, as I do not have too much experience with this framework. For the more problematic challenges I faced, I went to stack overflow for inspiration on how to find solutions and examples of problems that were similar to mine.

Experience with jupyter notebook and streamlit

- Working with streamlit was pretty nice. The documentation was decent, and easy to follow. I really liked the fact that they included examples in the documentation. This made it much easier to implement what I wanted. It was easy to get up and running, and I did not face any issues with streamlit.
- I did however not enjoy working with jupyter notebooks. I feel like it is clunky and unnecessary. I prefer working in normal files and just creating functions instead of code blocks. Since you can run cells out of order, this can lead to code working when it maybe shouldn't. When trying new stuff it might seem to work, but then when restarting it does not work anymore. This makes debugging and following proper structure challenging.
- I hope that jupyter notebooks will not play a big role in this course. I would rather prefer to document my code well in the normal files, as well as writing other important stuff in the README.md file or a text file or something else.
- With that being said I think this first assignment was great, and gave me a solid intuition for quickly deploying a simple dashboard.

Links:

- [GitHub](#)
- <https://github.com/ioeftedal/ind320ioeftedal>
- [Streamlit](#)
- <https://ind320ioeftedal.streamlit.app>

Getting into the code:

Start by installing dependencies

```
pip install -r requirements.txt
```

```
Requirement already satisfied: streamlit in
/opt/homebrew/lib/python3.10/site-packages (from -r requirements.txt
(line 1)) (1.50.0)
Requirement already satisfied: pandas in
/opt/homebrew/lib/python3.10/site-packages (from -r requirements.txt
(line 2)) (2.3.3)
Requirement already satisfied: watchdog in
/opt/homebrew/lib/python3.10/site-packages (from -r requirements.txt
(line 3)) (6.0.0)
Requirement already satisfied: faker in
/opt/homebrew/lib/python3.10/site-packages (from -r requirements.txt
(line 4)) (37.8.0)
Requirement already satisfied: altair>=4.0.0 in
/opt/homebrew/lib/python3.10/site-packages (from -r requirements.txt
(line 5)) (5.5.0)
Requirement already satisfied: vega_datasets in
/opt/homebrew/lib/python3.10/site-packages (from -r requirements.txt
(line 6)) (0.9.0)
Requirement already satisfied: matplotlib in
/opt/homebrew/lib/python3.10/site-packages (from -r requirements.txt
(line 7)) (3.10.6)
Requirement already satisfied: blinker<2,>=1.5.0 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
requirements.txt (line 1)) (1.9.0)
Requirement already satisfied: cachetools<7,>=4.0 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
requirements.txt (line 1)) (6.2.0)
Requirement already satisfied: click<9,>=7.0 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
requirements.txt (line 1)) (8.3.0)
Requirement already satisfied: numpy<3,>=1.23 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
requirements.txt (line 1)) (2.2.6)
Requirement already satisfied: packaging<26,>=20 in
/Users/ivareftedal/Library/Python/3.10/lib/python/site-packages (from
streamlit->-r requirements.txt (line 1)) (25.0)
Requirement already satisfied: pillow<12,>=7.1.0 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
requirements.txt (line 1)) (11.3.0)
Requirement already satisfied: protobuf<7,>=3.20 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
requirements.txt (line 1)) (6.32.1)
Requirement already satisfied: pyarrow>=7.0 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
```

requirements.txt (line 1)) (21.0.0)
Requirement already satisfied: requests<3,>=2.27 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
requirements.txt (line 1)) (2.32.5)
Requirement already satisfied: tenacity<10,>=8.1.0 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
requirements.txt (line 1)) (9.1.2)
Requirement already satisfied: toml<2,>=0.10.1 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
requirements.txt (line 1)) (0.10.2)
Requirement already satisfied: typing-extensions<5,>=4.4.0 in
/Users/ivareftedal/Library/Python/3.10/lib/python/site-packages (from
streamlit->-r requirements.txt (line 1)) (4.15.0)
Requirement already satisfied: gitpython!=3.1.19,<4,>=3.0.7 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
requirements.txt (line 1)) (3.1.45)
Requirement already satisfied: pydeck<1,>=0.8.0b4 in
/opt/homebrew/lib/python3.10/site-packages (from streamlit->-r
requirements.txt (line 1)) (0.9.1)
Requirement already satisfied: tornado!=6.5.0,<7,>=6.0.3 in
/Users/ivareftedal/Library/Python/3.10/lib/python/site-packages (from
streamlit->-r requirements.txt (line 1)) (6.5.2)
Requirement already satisfied: python-dateutil>=2.8.2 in
/Users/ivareftedal/Library/Python/3.10/lib/python/site-packages (from
pandas->-r requirements.txt (line 2)) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in
/opt/homebrew/lib/python3.10/site-packages (from pandas->-r
requirements.txt (line 2)) (2025.2)
Requirement already satisfied: tzdata>=2022.7 in
/opt/homebrew/lib/python3.10/site-packages (from pandas->-r
requirements.txt (line 2)) (2025.2)
Requirement already satisfied: jinja2 in
/opt/homebrew/lib/python3.10/site-packages (from altair>=4.0.0->-r
requirements.txt (line 5)) (3.1.6)
Requirement already satisfied: jsonschema>=3.0 in
/opt/homebrew/lib/python3.10/site-packages (from altair>=4.0.0->-r
requirements.txt (line 5)) (4.25.1)
Requirement already satisfied: narwhals>=1.14.2 in
/opt/homebrew/lib/python3.10/site-packages (from altair>=4.0.0->-r
requirements.txt (line 5)) (2.6.0)
Requirement already satisfied: gitdb<5,>=4.0.1 in
/opt/homebrew/lib/python3.10/site-packages (from gitpython!
=3.1.19,<4,>=3.0.7->streamlit->-r requirements.txt (line 1)) (4.0.12)
Requirement already satisfied: smmap<6,>=3.0.1 in
/opt/homebrew/lib/python3.10/site-packages (from gitdb<5,>=4.0.1-
>gitpython!=3.1.19,<4,>=3.0.7->streamlit->-r requirements.txt (line
1)) (5.0.2)
Requirement already satisfied: charset_normalizer<4,>=2 in
/opt/homebrew/lib/python3.10/site-packages (from requests<3,>=2.27-

```

>streamlit->-r requirements.txt (line 1)) (3.4.3)
Requirement already satisfied: idna<4,>=2.5 in
/opt/homebrew/lib/python3.10/site-packages (from requests<3,>=2.27-
>streamlit->-r requirements.txt (line 1)) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/opt/homebrew/lib/python3.10/site-packages (from requests<3,>=2.27-
>streamlit->-r requirements.txt (line 1)) (2.5.0)
Requirement already satisfied: certifi>=2017.4.17 in
/opt/homebrew/lib/python3.10/site-packages (from requests<3,>=2.27-
>streamlit->-r requirements.txt (line 1)) (2025.8.3)
Requirement already satisfied: contourpy>=1.0.1 in
/opt/homebrew/lib/python3.10/site-packages (from matplotlib->-r
requirements.txt (line 7)) (1.3.2)
Requirement already satisfied: cycler>=0.10 in
/opt/homebrew/lib/python3.10/site-packages (from matplotlib->-r
requirements.txt (line 7)) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in
/opt/homebrew/lib/python3.10/site-packages (from matplotlib->-r
requirements.txt (line 7)) (4.60.1)
Requirement already satisfied: kiwisolver>=1.3.1 in
/opt/homebrew/lib/python3.10/site-packages (from matplotlib->-r
requirements.txt (line 7)) (1.4.9)
Requirement already satisfied: pyparsing>=2.3.1 in
/opt/homebrew/lib/python3.10/site-packages (from matplotlib->-r
requirements.txt (line 7)) (3.2.5)
Requirement already satisfied: MarkupSafe>=2.0 in
/opt/homebrew/lib/python3.10/site-packages (from jinja2-
>altair>=4.0.0->-r requirements.txt (line 5)) (3.0.3)
Requirement already satisfied: attrs>=22.2.0 in
/opt/homebrew/lib/python3.10/site-packages (from jsonschema>=3.0-
>altair>=4.0.0->-r requirements.txt (line 5)) (25.3.0)
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in
/opt/homebrew/lib/python3.10/site-packages (from jsonschema>=3.0-
>altair>=4.0.0->-r requirements.txt (line 5)) (2025.9.1)
Requirement already satisfied: referencing>=0.28.4 in
/opt/homebrew/lib/python3.10/site-packages (from jsonschema>=3.0-
>altair>=4.0.0->-r requirements.txt (line 5)) (0.36.2)
Requirement already satisfied: rpds-py>=0.7.1 in
/opt/homebrew/lib/python3.10/site-packages (from jsonschema>=3.0-
>altair>=4.0.0->-r requirements.txt (line 5)) (0.27.1)
Requirement already satisfied: six>=1.5 in
/Users/ivareftedal/Library/Python/3.10/lib/python/site-packages (from
python-dateutil>=2.8.2->pandas->-r requirements.txt (line 2)) (1.17.0)

[notice] A new release of pip is available: 25.1.1 -> 25.2
[notice] To update, run: /opt/homebrew/opt/python@3.10/bin/python3.10
-m pip install --upgrade pip
Note: you may need to restart the kernel to use updated packages.

```

Import the installed dependencies

```
import pandas as pd
import matplotlib.pyplot as plt
```

Read the provided csv file

```
df = pd.read_csv("open-meteo-subset.csv")
```

Print all the data in the dataframe

```
print(df)
```

	time	temperature_2m (°C)	precipitation (mm)	\
0	2020-01-01T00:00	-2.2	0.1	
1	2020-01-01T01:00	-2.2	0.0	
2	2020-01-01T02:00	-2.3	0.0	
3	2020-01-01T03:00	-2.3	0.0	
4	2020-01-01T04:00	-2.7	0.0	
...	
8755	2020-12-30T19:00	-6.5	0.0	
8756	2020-12-30T20:00	-7.0	0.0	
8757	2020-12-30T21:00	-7.5	0.0	
8758	2020-12-30T22:00	-7.2	0.0	
8759	2020-12-30T23:00	-7.5	0.0	

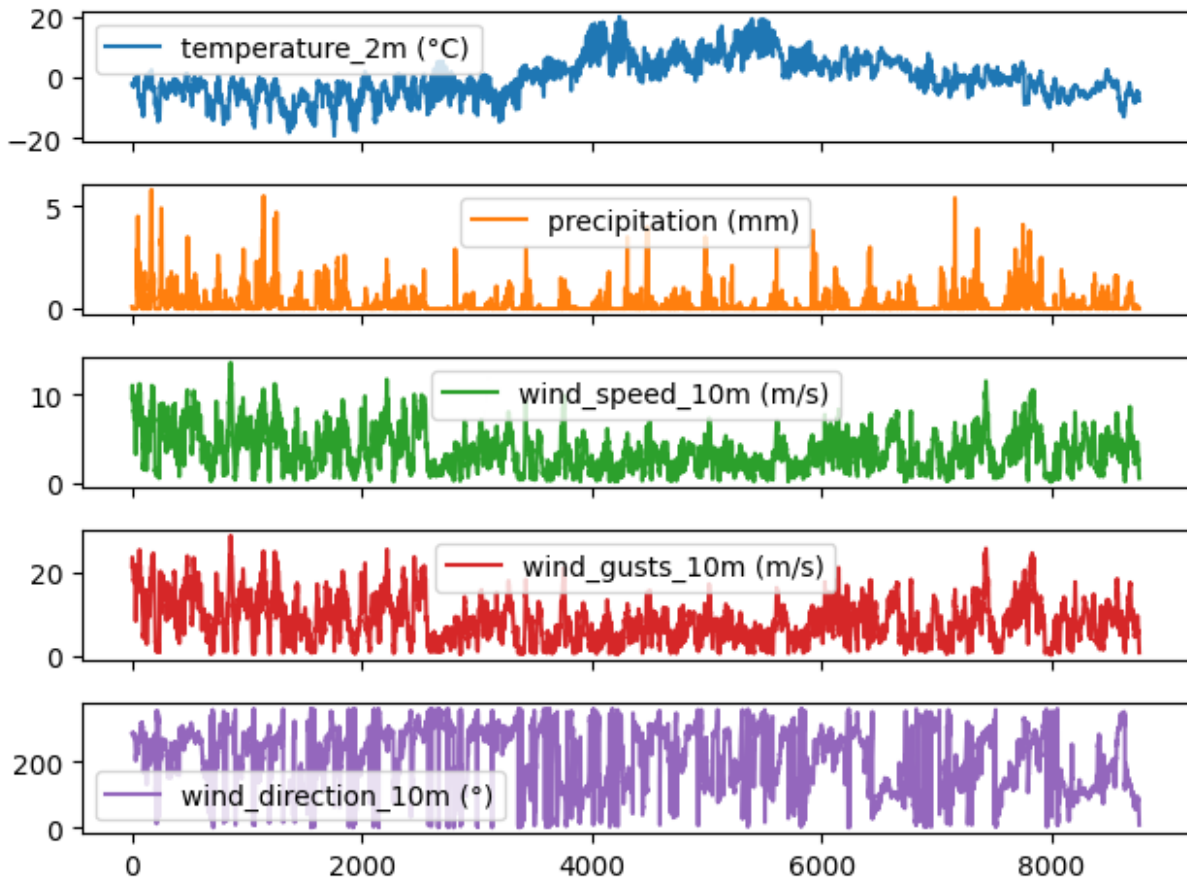
	wind_speed_10m (m/s)	wind_gusts_10m (m/s)	wind_direction_10m (°)
0	9.6	21.3	284
1	10.6	23.0	282
2	11.0	23.5	284
3	10.6	23.3	284
4	10.6	22.8	284
...
8755	1.6	4.0	58
8756	1.2	3.4	50
8757	1.1	2.4	22
8758	0.6	1.6	22
8759	0.5	0.7	8

```
[8760 rows x 6 columns]
```

Print each column separately

```
df.plot(subplots=True)
```

```
plt.tight_layout()  
plt.show()
```



Print all columns together

```
fig, ax1 = plt.subplots(figsize=(10, 6))
```

```
ax1.plot(df['time'], df['temperature_2m (°C)'], color = 'C0')  
ax1.set_xlabel('Time')  
ax1.set_ylabel('temperature_2m (°C)', color = 'C0')  
ax1.tick_params(axis = 'y', labelcolor = 'C0')
```

```
ax2=ax1.twinx()  
ax2.spines["right"].set_position(("axes", 1))  
ax2.plot(df['time'], df['precipitation (mm)'], color = 'C1')
```

```

ax2.set_ylabel('precipitation (mm)', color = 'C1')
ax2.tick_params(axis = 'y', labelcolor = 'C1')

ax3=ax1.twinx()
ax3.spines["right"].set_position(("axes", 1.1))
ax3.plot(df['time'], df['wind_speed_10m (m/s)'], color = 'C2')
ax3.set_ylabel('wind_speed_10m (m/s)', color = 'C2')
ax3.tick_params(axis = 'y', labelcolor = 'C2')

ax4=ax1.twinx()
ax4.spines["right"].set_position(("axes", 1.2))
ax4.plot(df['time'], df['wind_gusts_10m (m/s)'], color = 'C3')
ax4.set_ylabel('wind_gusts_10m (m/s)', color = 'C3')
ax4.tick_params(axis = 'y', labelcolor = 'C3')

ax5=ax1.twinx()
ax5.spines["right"].set_position(("axes", 1.3))
ax5.plot(df['time'], df['wind_direction_10m (°)'], color = 'C4')
ax5.set_ylabel('wind_gusts_10m (m/s)', color = 'C4')
ax5.tick_params(axis = 'y', labelcolor = 'C4')

ax1.set_title('Weather Data In 2020')
fig.show()

/var/folders/sz/3yw64x157p3b5x22430zk7p00000gn/T/
ipykernel_57373/564956209.py:33: UserWarning: FigureCanvasAgg is non-
interactive, and thus cannot be shown
fig.show()

```

